

**REMARKS**

Claims 3-5, 8, 23-33, 37-40, 42, and 45-47 are pending in the application. Claims 23-33, 37-40, and 42 are withdrawn as being drawn to non-elected inventions. Claims 3-5, 8, 45, and 46 are under active consideration.

Claims 3, 45, and 46 have been rewritten in independent form as suggested by the Examiner. The Examiner has indicated that claims 3, 4, 45, and 46, as currently written, are allowable (see Office Action, page 6).

The foregoing amendments are made without prejudice, without intent to abandon any originally claimed subject matter, and without intent to acquiesce in any rejection of record. Applicants expressly reserve the right to file one or more continuing applications hereof containing the canceled or unamended claims.

Applicants note with appreciation the withdrawal of the previous rejection under 35 U.S.C. § 102(e).

**Information Disclosure Statement**

Applicants are providing a copy of international patent application publication WO 96/38474, which was not previously considered in the Information Disclosure Statement, submitted April 16, 2007, for the Examiner's convenience. Applicants respectfully request that the Examiner now consider this reference.

**35 U.S.C. § 102**

Claim 5 remains rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Houghton et al. (International Patent Publication No. WO 91/15771; hereinafter "Houghton-1") or under 35 U.S.C. § 102(e) as allegedly being anticipated by Houghton et al. (U.S. Patent No. 5,683,864; hereinafter "Houghton-2"). Houghton-1 and Houghton-2 have been cited for teaching compositions for eliciting an antibody or T cell response to HCV. The Office Action further alleges that "the applicant's argument that the references fail to show certain feature of applicant's invention, i.e. the composition comprising 'an adjuvant' is not recited in the rejected claim(s)" (Office Action, page 3). Applicants respectfully traverse the rejection and the supporting remarks.

Contrary to the Examiner's assertions that the claims do not recite an adjuvant (see Office Action, page 3), claim 5 makes explicit that the composition includes an adjuvant. Applicants again emphasize that neither Houghton-1 nor Houghton-2 pertains to compositions for eliciting an immune response. The focus of Houghton-1 and Houghton-2 is on compositions for immunoassays and diagnostics, that is, compositions that detect antibodies, as opposed to compositions that elicit antibody or T-cell responses. See, *e.g.*, page 6, lines 13-16 of Houghton-1 and column 4, lines 5-8 of Houghton-2. Thus, both references fail to describe any composition comprising an adjuvant that activates HCV-specific T cells. Therefore, claim 5 is not anticipated by Houghton-1 and Houghton-2, and withdrawal of the rejections under 35 U.S.C. §§ 102(b) and 102(e) is respectfully requested.

#### **Nonstatutory Double Patenting**

The Examiner has provisionally rejected claim 5 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 45 of copending U.S. Patent Application Serial No. 10,612,884. In particular, the Office Action alleges that claim 45 of copending U.S. Patent Application Serial No. 10/612,884 is directed to a composition comprising NS4, NS5, NS5a, NS5b, and a core antigen having defined amino acid sequences that could be considered to be species of the generically claimed HCV antigen polyproteins in claims 5 and 8 of the instant application (Office Action, page 5). Applicants reiterate their request that the rejection be held in abeyance until there is an indication of allowable subject matter in either application.

#### **35 U.S.C. § 103**

Claims 5 and 8 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the reference of Cho et al. (Vaccine (1999) 17:1136-1144; hereinafter "Cho") in view of the reference of Lagging et al. (J. Virol. (1995) 69:5859-5863; hereinafter "Lagging") or Geissler et al. (J. Immunol. (1997) 159:5107-5113; hereinafter "Geissler"). Cho is cited for teaching DNA expression vectors encoding the non-structural polyprotein of HCV comprising NS3, NS4, and NS5 (pTV-NS345), including residues 1019-3010, which comprise NS5a and NS5b, immunogenic compositions comprising such DNA expression vectors, and methods of

using such compositions to induce both humoral and T cell specific immune responses against HCV non-structural proteins, NS3, NS4, NS5a, and NS5b with or without an adjuvant (Office Action, page 5). Geissler and Lagging are cited for teaching that the HCV core antigen contains both T cell and B cell immunological epitopes that are able to induce significant T cell (CTL and cytokine) and B cell humoral responses (Office Action, pages 5-6). The Office Action alleges:

Therefore, it would have been obvious for any person [of] skill in the art to be motivated for making an immunogenic composition with both HCV structural core and non-structural NS345 antigens for inducing an optimal significant immune response against each of the HCV replication related antigens optionally with an adjuvant since all of the HCV antigens proteins encode different structural and non-structural proteins are required for the HCV replication. Especially, each of the non-structural proteins encodes different protease and RNA-dependent replication related enzymes, such as RDRP, and each of them has been approved to contain T cell and/or B cell epitopes and is able to induce a significant immune response. (Office Action, page 6)

Applicants respectfully traverse the rejection and the supporting remarks.

The decision by the Supreme Court in *KSR Int'l Co. v. Teleflex, Inc.*, No 04-1350 (U.S. Apr. 30, 2007) reaffirmed the viability of the four factual inquiries underlying an obviousness analysis provided in *Graham v. John Deere*, 148 USPQ 459, 467 (U.S. 1966). These factors include: (a) determining the scope and contents of the prior art; (b) ascertaining the differences between the prior art and the claims in issue; (c) resolving the level of ordinary skill in the pertinent art; and (d) evaluating evidence of secondary considerations. Moreover, the Supreme Court in *KSR* recognized that the “teaching, suggestion, or motivation” analysis provides a helpful insight in determining whether the claimed subject matter is obvious. This analysis is provided in MPEP 2142. In particular, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Additionally, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Both the teaching or suggestion to make the claimed combination, as well as the reasonable expectation of success, must be found in the prior art, not in applicant’s disclosure. See, e.g., *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991).

Based on the foregoing, applicant respectfully submits the Office has failed to establish a *prima facie* case of obviousness.

The primary reference of Cho pertains to DNA immunization with vectors encoding HCV antigens, including NS3, NS4, and NS5. Cho fails to describe or suggest immunogenic compositions comprising HCV polypeptide antigens, as claimed. Nor does Cho describe or suggest including a core polypeptide in immunogenic compositions, as in the instant application.

The secondary references of Lagging and Geissler, like Cho, also pertain to DNA immunization, not to immunization with polypeptide antigens, as in the current application. Furthermore, Lagging and Geissler only describe vectors expressing the HCV core antigen and fail to describe or suggest combining the core polypeptide with any other HCV polypeptides. Thus, all of the cited references pertain to DNA immunization and are irrelevant to the claimed invention.

For at least these reasons, withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

**CONCLUSION**

In light of the above remarks, Applicants submit that the present application is fully in condition for allowance. Early notice to that effect is earnestly solicited.

If the Examiner contemplates other action, or if a telephone conference would expedite allowance of the claims, Applicants invite the Examiner to contact the undersigned.

The Commissioner is hereby authorized to charge any fees and credit any overpayment of fees which may be required under 37 C.F.R. §1.16, §1.17, or §1.21, to Deposit Account No. 18-1648.

Please direct all further written communications regarding this application to:

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Respectfully submitted,

Date: October 26, 2007

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